Alaska Department of Fish and Game
Division of Wildlife Conservation
December 2001

Interrelationships of Dall Sheep and Predators in the Central Alaska Range

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Research Performance Report
1 July 2000–30 June 2001
Federal Aid in Wildlife Restoration
Grant W-27-4, Project 6.13

This is a progress report on continuing research. Information may be refined at a later date.

Federal Aid in Wildlife Restoration

RESEARCH PROGRESS REPORT

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
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PROJECT TITLE: Interrelationships of Dall sheep and predators in the Central Alaska Range

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GRANT AND SEGMENT NR.: W-27-4

PROJECT NR.: 6.13

SEGMENT PERIOD: 1 July 2000–30 June 2001

STATE: Alaska

WORK LOCATION: Central Alaska Range, Unit 20A

I. PROGRESS ON PROJECT OBJECTIVES

OBJECTIVE 1: Estimate annual pregnancy and birth rates for adult ewes.

Ewes were captured and radiocollared, and blood samples were obtained for pregnancy determination. Nineteen ewes were captured during March 1999, 22 during March 2000 (includes 13 recaptures), and 23 during March 2001 (includes 19 recaptures).

OBJECTIVE 2: Estimate lamb survival to yearling age class and determine causes of mortality.

Lambs were captured and radiocollared during late May–early June, and monitored during June–April to estimate survival and mortality causes. Twenty-four lambs were captured during 1999, 23 during 2000, and 23 during 2001.

OBJECTIVE 3: Estimate annual survival and determine causes of mortality of adult ewes.

Radiocollared ewes were monitored approximately twice per month from March 1999–June 2001 to estimate survival and causes of mortality.

OBJECTIVE 4: Monitor movements of coyotes in relation to sheep distribution to determine proportion of coyotes that forage in sheep habitat.

From March 1998–May 2001, 17 coyotes were captured and radiocollared, then located approximately twice per month to determine home ranges, habitat use, movement patterns, and reproductive success. These included 13 resident adults (5 M:F pairs, plus 3 mortalities), 3 pups (2 M, 1 F; aged 10–13 months), and one dispersing 2-year-old male.

OBJECTIVE 5: Assess spatial and temporal variability in coyote predation on lambs.

Timing and locations of lamb mortalities due to coyote predation were recorded. These data will be compared among years.

OBJECTIVE 6: Assess trends in sheep population and reproductive success over time.

The sheep population in the study area was surveyed annually during June 1995–2001. Surveys consisted of intensive searches conducted with R-22 helicopters. Sheep were counted and classified as lambs, yearlings, adult ewes, or rams (4 horn size classes).

OBJECTIVE 7: Analyze and publish results.

Work on this objective is scheduled to begin during FY02.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD

JOB 1: Estimate annual pregnancy and birth rates for adult ewes.

Blood samples were obtained from 24 adult ewes during March 2001. Serum samples have been sent to the University of Alaska Fairbanks for progesterone analysis. All of these ewes were radiocollared (20 had been collared previously), but 2 collars began operating intermittently so lambing success could not be determined. Of the remaining 22 ewes, 12 (55%) were seen with lambs during late May or early June. The lambing rate during 2001 was less than during 1999 or 2000 (76 and 68%, respectively), despite a relatively mild winter 2000–2001.

JOB 2: Estimate lamb survival to yearling age class and determine causes of mortality.

One of 23 lambs collared in May 2000 shed its collar. Of the remaining 22 lambs, 6 (27%) survived through May 2001. All but 1 of these deaths were due to predation; 1 lamb evidently was abandoned by its mother. Coyotes caused at least 8 and possibly 10 deaths; wolves caused at least 1 and possibly 3 deaths, and eagles killed 3 lambs. Twenty-three lambs were captured and radiocollared during late May and early June 2001. The peak of lambing occurred during the first week of June, approximately 2 weeks later than in previous years. Three lambs shed their collars, and 12 (60%) of the remaining 20 lambs survived through 30 June. All eight deaths were due to predators; 4 were caused by eagles, 2 by wolverines, and 2 by either wolverines or coyotes.

JOB 3: Estimate annual survival and determine causes of mortality of adult ewes.

Twenty-one ewes that were radiocollared during previous years were monitored during FY01. Four additional ewes were captured and radiocollared during March 2001. Only 1 ewe died, evidently killed by wolves during October 2000.

JOB 4: Monitor movements of coyotes in relation to sheep distribution to determine proportion of coyotes that forage in sheep habitat.

Movements of 12 radiocollared coyotes were monitored during some or all of FY01. These included 5 resident adult pairs, 1 juvenile female, and 1 adult male that paired with a collared female whose previous mate was killed by wolves. One other collared adult male was killed by a trapper; its mate (also collared) was subsequently seen with another coyote on 2 occasions, but was usually alone. The juvenile female also died, but cause of her death could not be determined. Data on home ranges and habitat use were collected and will be compared with sheep distributions to assess coyote foraging behavior. In addition, University of British Columbia graduate student Laura Prugh collected coyote scats and assessed populations of hares and small rodents as part of a cooperative study of coyote foraging behavior in the study area.

JOB 5: Assess spatial and temporal variability in coyote predation on lambs.

Locations of known or suspected coyote kills were recorded and the spatial and temporal distribution will be compared among years.

JOB 6: Assess trends in sheep population and reproductive success over time.

The sheep population was surveyed on 21–22 June using an R-22 helicopter. The population in the survey units increased from 615 in 2000 to 624 in 2001, mainly due to the presence of more rams compared to previous years. In units surveyed every year since 1995, only 72 lambs and 48 yearlings were counted during 2001. This was fewer than during 1995–1999 ($\bar{x}$ = 117 lambs, 79 yearlings), and supports radiotracking data that indicated poor lamb production during 2000 and 2001.

JOB 7: Analyze and publish results.

Work on this job will begin during FY2002.

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

In cooperation with National Park Service biologists, a helicopter survey of eagle nests in part of the sheep study area was conducted during July 2000.

IV. RECOMMENDATIONS FOR THIS PROJECT

Predation by eagles has been the main cause of death of lambs during 2 of the 3 years of this study. Research elsewhere has suggested that eagle nesting success is greatly influenced by population cycles of hares, which have recently begun to crash in Unit 20A. Further research concerning the relationships among hare populations, eagle nesting success, and survival of Dall sheep lambs would be a valuable addition to the present study.

V. PUBLICATIONS

None during this report period.

VI. FEDERAL AID TOTAL PROJECT COSTS FOR THIS SEGMENT PERIOD

$50,755

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